

## A Rationale for Abnormal, Male-dominated Sex-ratios in Adult Populations of *Zygaena* (Lep.: Zygaenidae)

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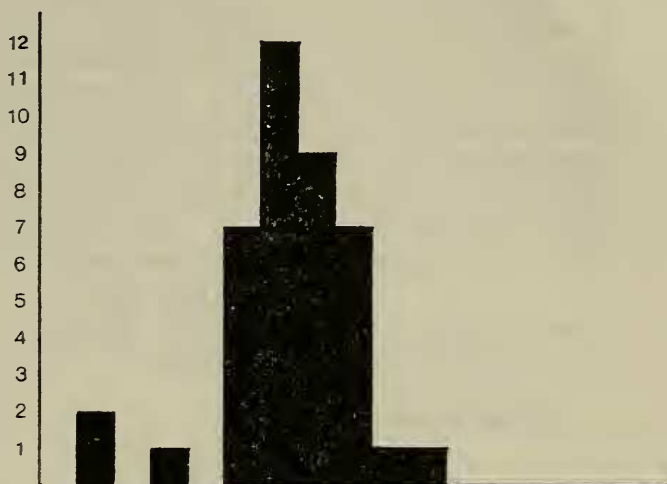
A recent paper (Larsen, 1974) in this journal reports the discovery of an apparently male-biased population of *Zygaena carniolica* Scopoli in the Lebanon and speculates as to the possible biological significance of such a finding. This has stimulated the present author to submit part of the results from a study of the parasites of *Zygaena filipendulae* L. in the hope that some light may be shed on this interesting phenomenon.

Most of the primary parasites of *Zygaena*, at least in England, show a high degree of host-specificity, and normally attack hosts of no other genus. For this reason, and also because the host colonies are often more-or-less static, *Zygaena* parasites will tend to act as delayed density-dependent mortality factors and, under certain circumstances, may attain a high percentage parasitism of their hosts. One of the genus-specific parasites of *Zygaena* in England is *Mesostenidea obnoxius* (Gravenhorst) (Hym.: Ichneumonidae) which develops as a solitary ectoparasite of pupae and prepupae inside the host cocoons, oviposition taking place after the host has spun up. During the summer of 1973 the author sampled *Z. filipendulae* cocoons at Abbots Moss in Cheshire, a site at which *M. obnoxius* was present, although at that time not particularly common. The moths which emerged from one sub-sample were sexed and, as a matter of routine, the lengths of their cocoons were measured. All of the cocoons containing *M. obnoxius* were measured in the same way, and these data are collected in histogram form below, where it will be seen that the parasite very definitely tends to select the largest cocoons available to it which are predominantly of female moths. The bionomic implications of this are interesting, for it appears that the parasite must exert an influence on the subsequent host population disproportionate to its actual level of parasitism. Although at first sight this suggests a potentially wasteful over-exploitation of the host by its parasite, it may possibly be of adaptive significance in permitting the out-of-hand rejection of *Zygaena* cocoons harbouring the usually abundant endoparasitic Ichneumonid *Casinarina orbitalis* (Gravenhorst), which are presumably unsuitable for the development of *M. obnoxius* and also considerably smaller than those of healthy hosts owing to the parasite's development in the growing larva.

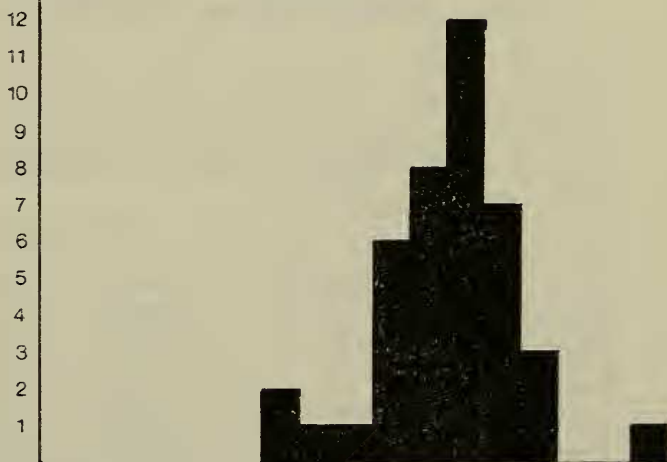
Returning now to the population of *Z. carniolica* discussed by Larsen, it was noted that of the 456 cocoons collected only 170 produced moths, and "most of the rest were parasitised". Supposing that a parasite of *Zygaena* cocoons behaving in a way similar to that found in *M. obnoxius* were present, it would be simple to determine roughly the level of parasitism

Frequencies of cocoon length of *Zygaena filipendulae*  
from Abbots Moss, Cheshire, 1973

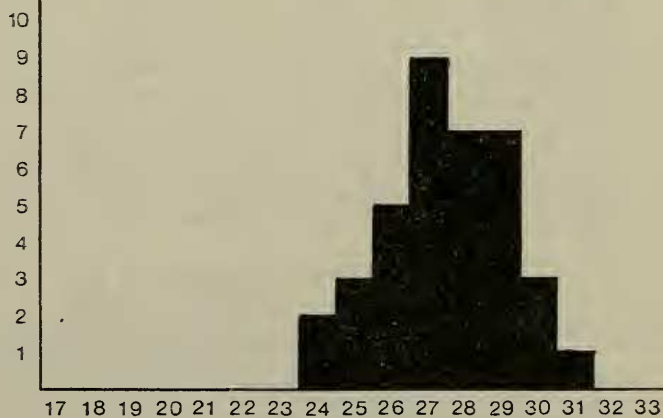
Cocoons producing  
male moths  
(one sub-sample)



Cocoons producing  
female moths  
(from the above sub-  
sample)



Cocoons harbouring  
*Mesostenidea obnoxius*  
(total collection)



Cocoon length (mm)

it would need to achieve in order to account for the anomalous sex-ratio observed. Of the 170 moths to emerge from the cocoons two-thirds were male; i.e. about 57 females were inexplicably "missing" from the sample of 456 cocoons. A parasite attacking only female cocoons would produce this result at a level of around 12% (i.e. parasitising 25% of the otherwise viable host cocoons), and one attacking females and males in a ratio of 5:1 (below the lowest estimate for the bias reported here for *M. obnoxius*) would still require only an 18% level of representation to account for the results. For a colonial host likely to have specific parasites these figures are well within the range one might reasonably expect.

#### Reference

Larsen, T. B. (1974). A possibly Abnormal Sex-ratio in *Zygaena carniolica* Scopoli (Lep.: Zygaenidae). *Ent. Rec.*, **86**: 165-167.

## New Forest Mercury Vapour Light Records for 1974

By L. W. SIGGS

Sungate, Football Green, Minstead, Lyndhurst, Hants.

1974 was another poor year; indeed, the worst since the Robinson trap was started in 1962. The months of April, July and October were the lowest recorded and only March was above average. Nights without low temperature, rain or strong wind were exceptional.

|           | Nights | Specimens |         | Species |
|-----------|--------|-----------|---------|---------|
|           |        | Total     | Average | Average |
| March     | 17     | 1,186     | 70      | 8       |
| April     | 30     | 1,732     | 58      | 9       |
| May       | 31     | 669       | 22      | 12      |
| June      | 29     | 2,986     | 103     | 32      |
| July      | 31     | 4,410     | 142     | 43      |
| August    | 31     | 3,818     | 123     | 37      |
| September | 30     | 1,698     | 57      | 15      |
| October   | 31     | 709       | 23      | 6       |
| November  | 20     | 439       | 22      | 5       |

The total number of species recorded was 316.

In contrast to last year, only one species — *Cerastis rubricosa* D & S. — put up a record. 211 specimens came to the trap, the previous highest being 187 in 1965.

There were three additions to the Minstead list: —

*Agrotis trux lunigera* Steph.

*Discoloxia blomeri* Curt. (The first Hampshire record.)

*Eupithecia satyrata* Hübn. (determined by Mr. D. S. Fletcher).

The following species, which are occasional here, were recorded: — *Agrotis clavis* Hufn., *Tethea* or D. & S., *Moma alpium* Osbeck, *Elaphria venustula* Hübn., *Euxoa tritici* L., *Archanara sparganii* Esp., *Diloba caeruleocephala* L., *Idaea*